



STATISTICS

MEASURE + ANALYZE



INFERENTIAL



STATISTICS



DESCRIPTIVE





Descriptive vs Inferential Statistics

- **Descriptive statistics**
 - Collecting, presenting, and describing data
- **Inferential statistics**
 - Drawing conclusions and/or making decisions concerning a population based only on sample data

"Data Science & AI"
by
Siva Rama Krishna



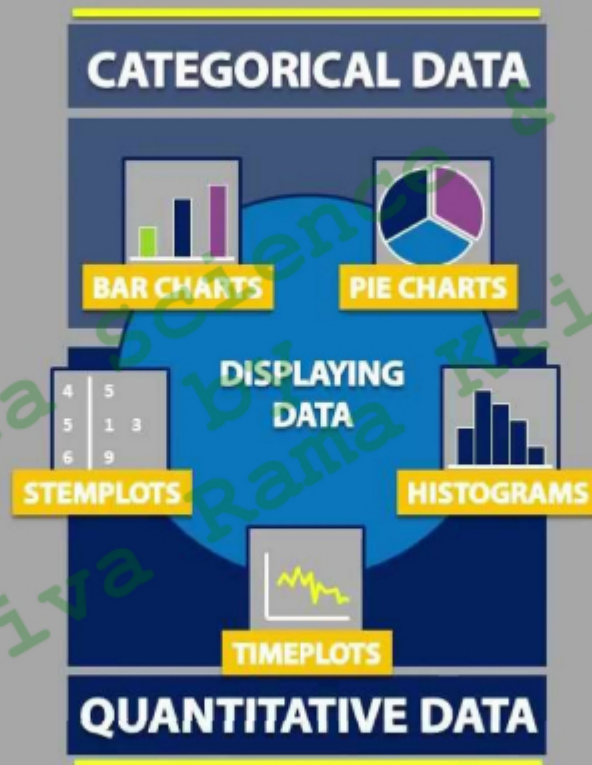
Populations and Samples

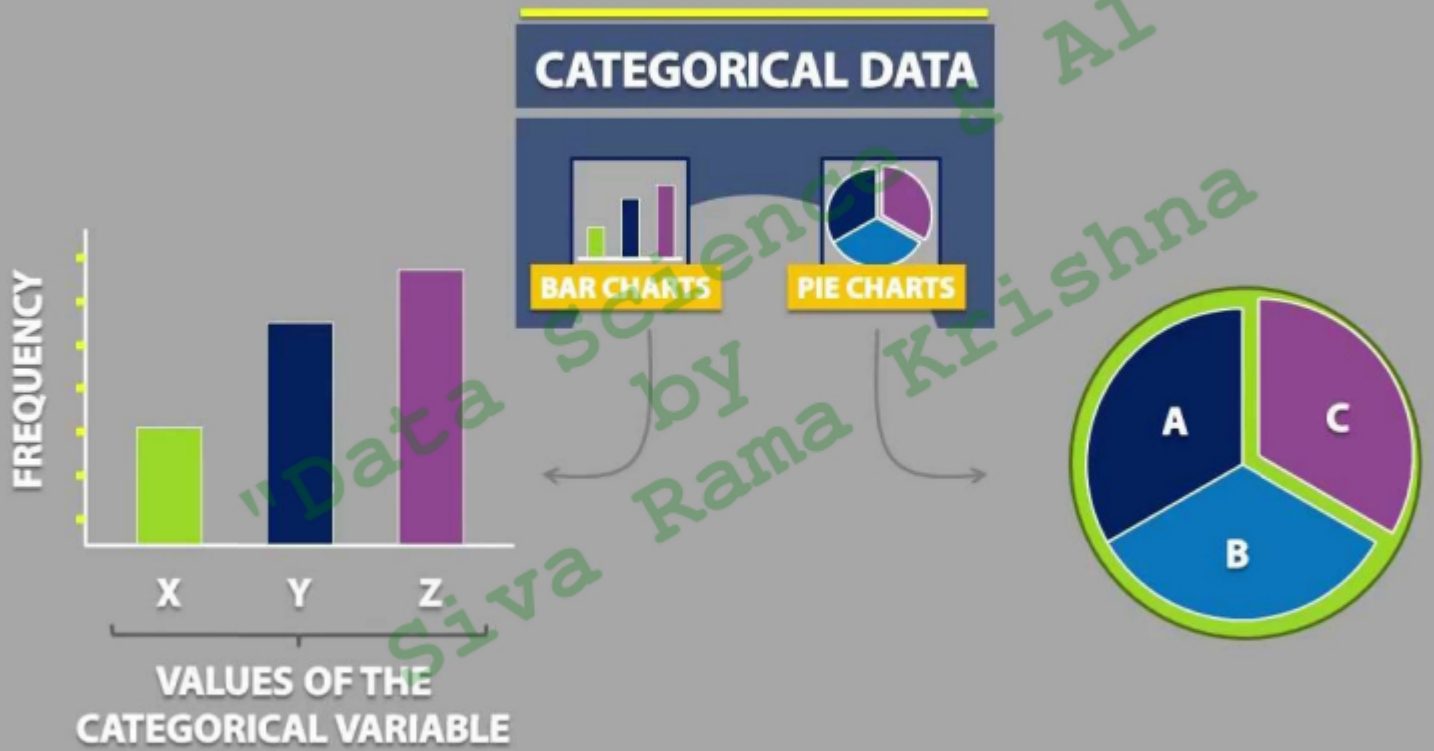
- A **Population** is the set of all items or individuals of interest
 - Examples:
 - All likely voters in the next election
 - All parts produced today
 - All sales receipts for November
- A **Sample** is a subset of the population
 - Examples:
 - 1000 voters selected at random for interview
 - A few parts selected for destructive testing
 - Random receipts selected for audit



Why Sample?

- Less time consuming than a census
- Less costly to administer than a census
- It is possible to obtain statistical results of a sufficiently high precision based on samples.
- Because the research process is sometimes destructive, the sample can save product
- If accessing the population is impossible; sampling is the only option





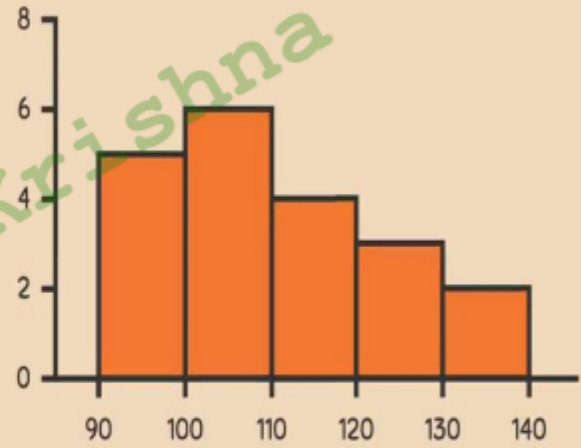


90 lbs 100 lbs 108 lbs 99 lbs 101 lbs 130 lbs 110 lbs 138 lbs 129 lbs 96 lbs



100 lbs 110 lbs 92 lbs 109 lbs 115 lbs 120 lbs 91 lbs 119 lbs 106 lbs 125 lbs

FREQUENCY



WEIGHT (LBS)



FREQUENCY DISTRIBUTION



120 lbs

WEIGHT

100 – 110

110 – 120

120 – 130

130 – 140

140 – 150

120

130

**BY CONVENTION, WE SAY THAT
EACH INTERVAL DOES NOT
INCLUDE THE RIGHT END POINT**





TIMEPLOT

SHOW HOW A VARIABLE CHANGES OVERTIME

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TIMEPLOT

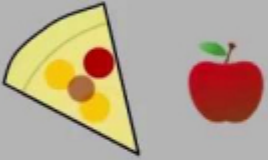
SHOW HOW A VARIABLE CHANGES OVER TIME





VARIABILITY

FOOD PREFERENCES



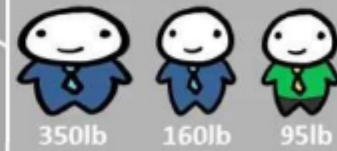
HAIR COLOUR



HEIGHT



WEIGHT





MEASURE VARIABLE

QUANTITATIVE DATA

DATA THAT IS MEASURED IN NUMBERS. IT DEALS WITH NUMBERS THAT MAKE SENSE TO PERFORM ARITHMETIC CALCULATIONS WITH

CATEGORICAL DATA

REFERS TO THE VALUES THAT PLACE "THINGS" INTO DIFFERENT GROUPS OR CATEGORIES

QUANTITATIVE VARIABLES

HEIGHT
WEIGHT
MIDTERM SCORE

CATEGORICAL VARIABLES

HAIR COLOUR
TYPE OF CAT
LETTER GRADE



CATEGORICAL VARIABLE

CATEGORICAL AND ORDINAL

LOGICAL ORDERING TO THE VALUES OF A CATEGORICAL VARIABLE

EX: LETTER GRADE

F C C+ B B+ A A+

CATEGORICAL AND NOMINAL

NO LOGICAL ORDERING TO THE VALUES OF A CATEGORICAL VARIABLE

EX: HAIR COLOUR

RED BLONDE BROWN BLUE



QUANTITATIVE VARIABLE

DISCRETE

REFER TO VARIABLES THAT CAN ONLY BE MEASURED IN CERTAIN NUMBERS

EX: NUMBER OF PETS YOU OWN

0 1 2 30 2.7

CONTINUOUS

REFER TO VARIABLES THAT CAN TAKE ON ANY NUMERICAL VALUE

EX: WEIGHT

105 185 170.683

